Cambridge Assessment International Education

Science

Stage 9

Paper 1

2024

Cambridge Lower Secondary Progression Test

Name

Class

Date

45 minutes

No additional materials are needed.

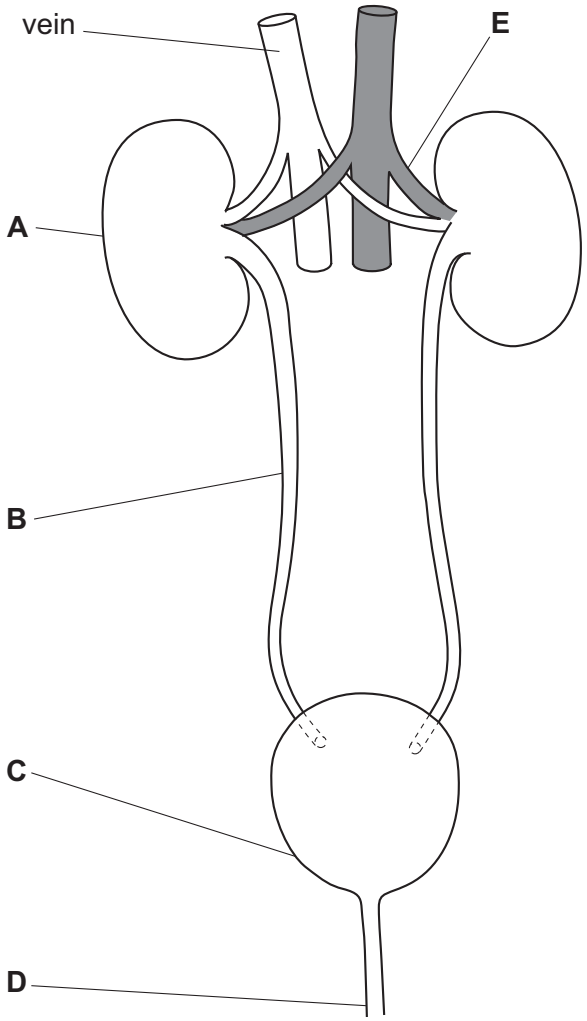
INSTRUCTIONS

- Answer **all** questions.
- Write your answer to each question in the space provided.
- You should show all your working on the question paper.

INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [ ].

1 Look at the diagram of the human excretory (renal) system.



(a) Complete the table to name the parts labelled **A**, **B**, **C**, **D** and **E**.

part	name of part
A	.....
B	.....
C	.....
D	.....
E	.....

[3]

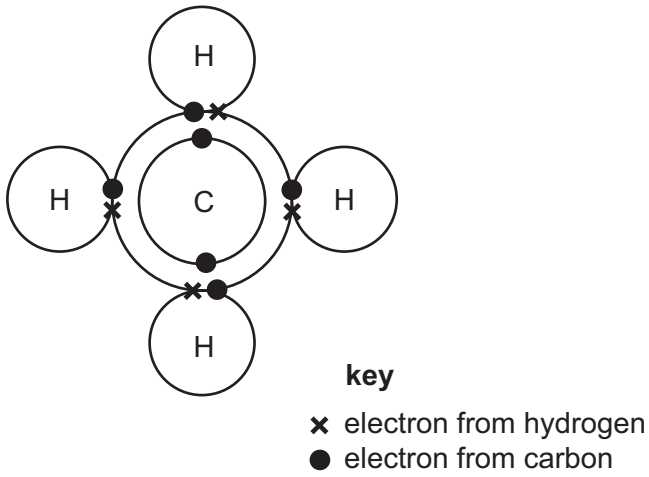
(b) Urea ammonium nitrate is an organic fertiliser.

What do plants make using nitrates?

..... [1]

2 Methane has a simple structure.

Look at the model of a molecule of methane.



(a) How many electrons are in a molecule of methane?

.....[1]

(b) Write down the type of bonding in a molecule of methane.

Explain your answer.

type of bonding .....

explanation .....

.....

[2]

(c) Methane has a simple structure.

Predict **one physical** property of methane.

.....[1]

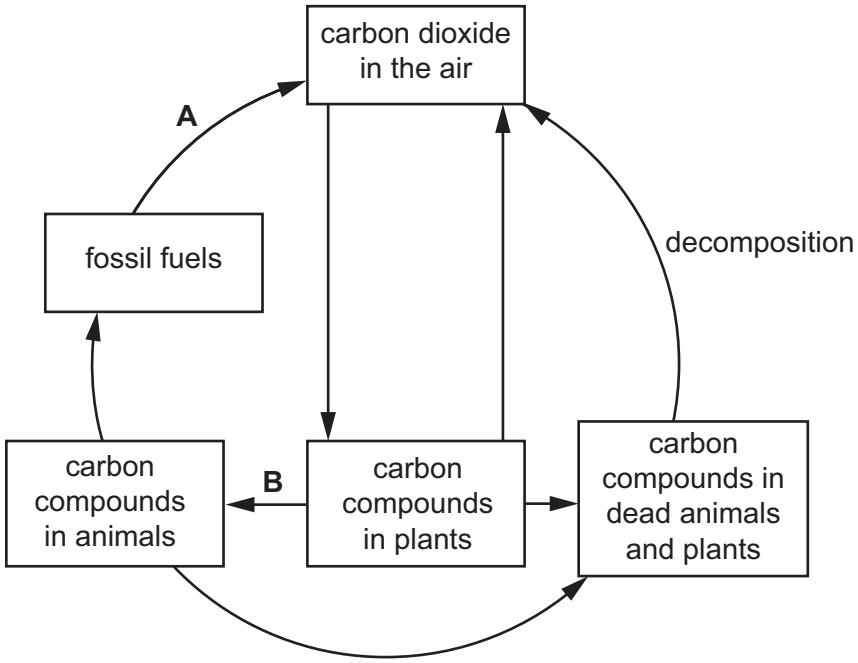
3 Jamila spills some liquid on the back of her hand.

After a short time, Jamila's hand feels cold.

Name the process that makes her hand feel cold.

.....[1]

4 Look at the diagram of part of the carbon cycle.



(a) One of the arrows in the diagram shows photosynthesis.

Write the letter **P** on the arrow that shows photosynthesis. [1]

(b) Name process **A** and process **B**.

process **A** .....

process **B** .....

[2]

5 Lily reacts magnesium with copper sulfate solution.

(a) Name this type of reaction.

.....[1]

(b) Name the **two** products of this reaction.

..... and .....[2]

(c) Lily adds zinc to magnesium sulfate solution.

There is **no** reaction.

Explain why there is **no** reaction.

.....

.....[1]

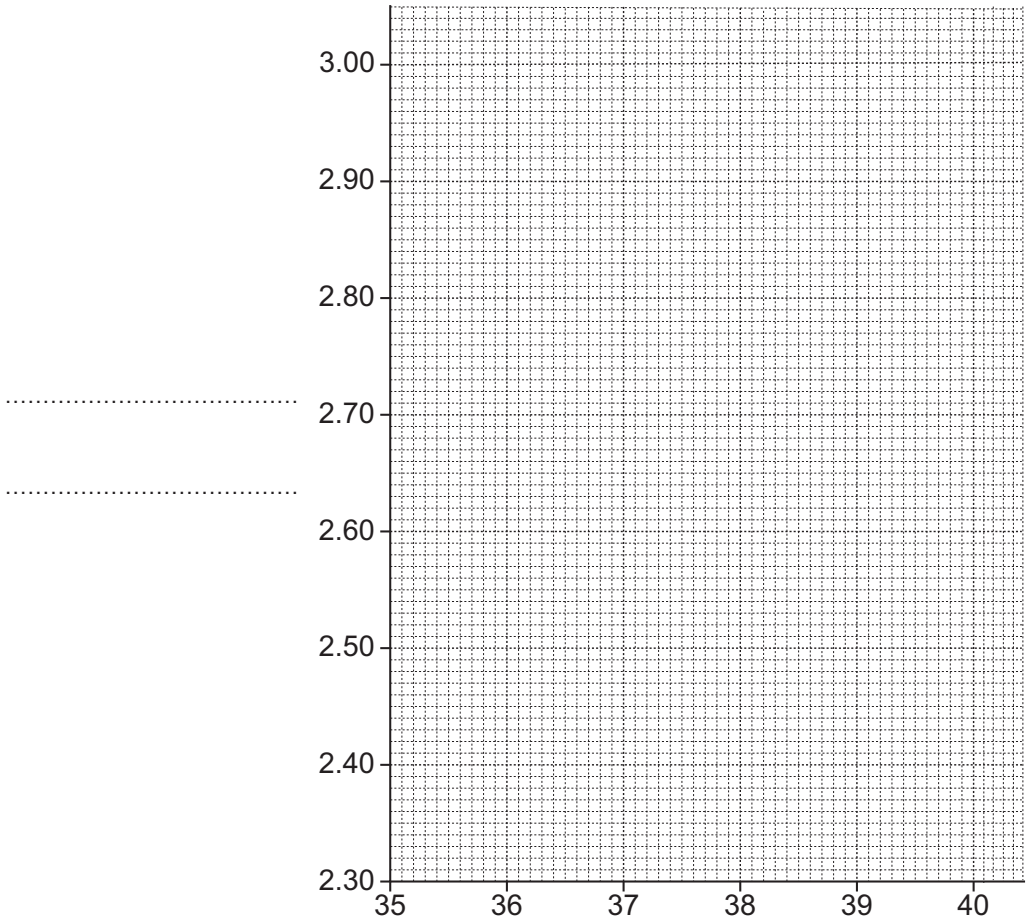
6 Fetal development is affected by the health of the mother.

The table shows information about the mass of a fetus during pregnancy for a mother who smokes.

age of the fetus in weeks	mass of the fetus in kg
36	2.40
37	2.55
38	2.60
39	2.85
40	3.00

(a) Draw the graph of this information:

- label the *x*-axis
- label the *y*-axis
- plot all the points from the table.



.....

.....

.....

.....

[2]

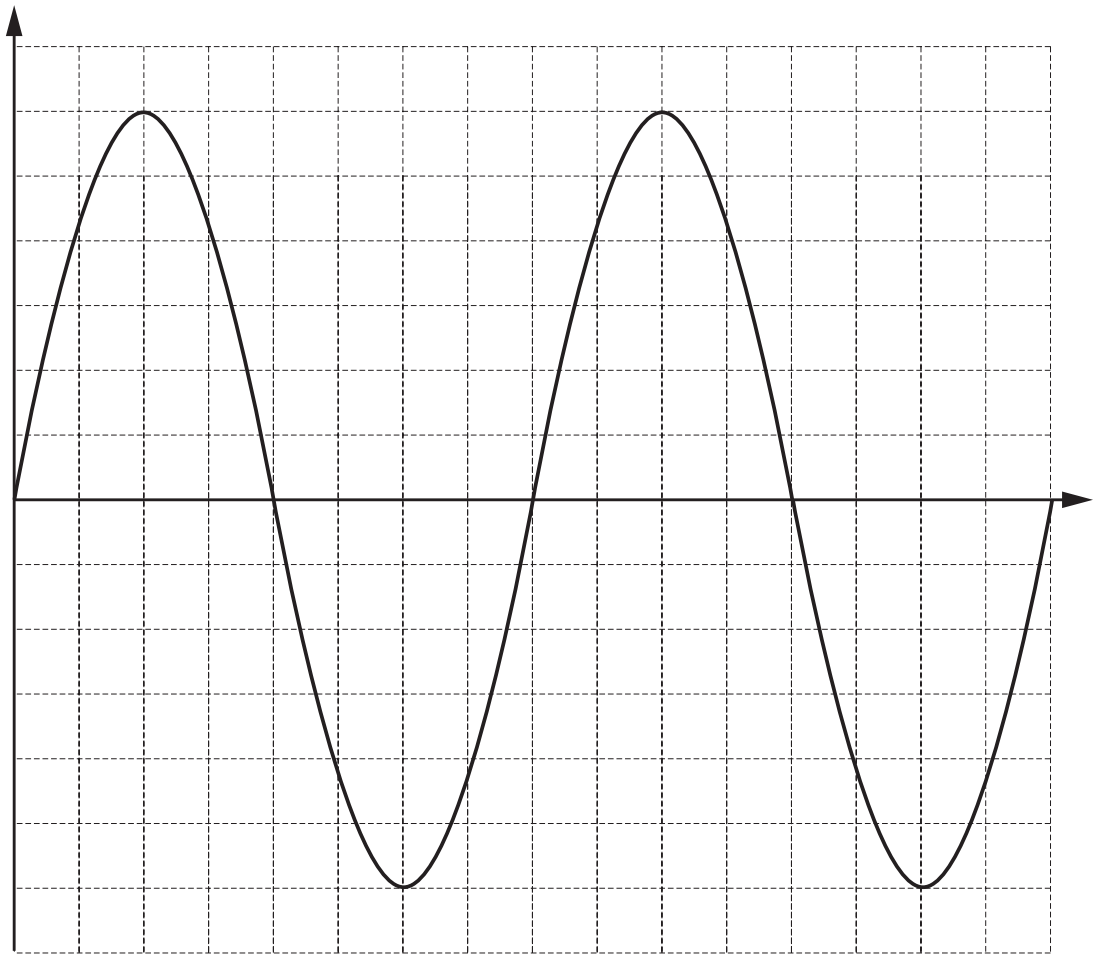
(b) There is **one** anomalous result.

Circle the anomalous result on the graph. [1]

(c) Draw a line of best fit on the graph. [1]

7 This question is about different waveforms and sounds.

(a) Look at the diagram of a waveform.



Draw a double-headed arrow (↔ or ↕) on the diagram to show the amplitude of the waveform. [1]

(b) Aiko hears a high pitch sound and then a low pitch sound.

Write a sentence to compare the frequencies of the two sounds.

.....

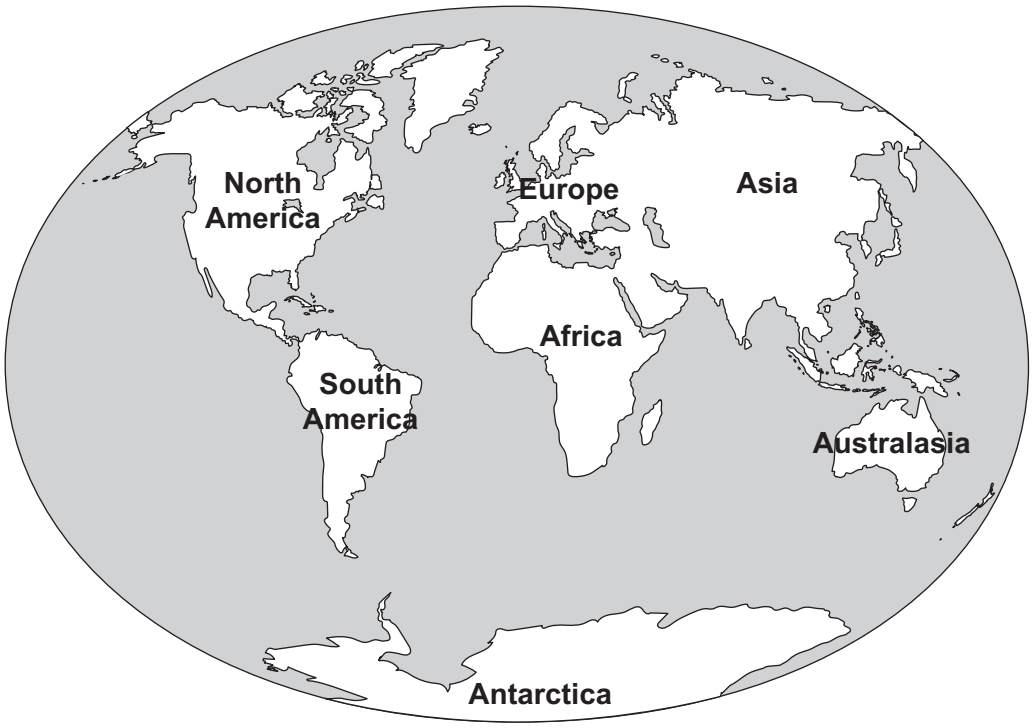
..... [1]

(c) Aiko plays a sound on her phone.

Complete the sentence.

The louder the sound the larger the ..... . [1]

8 The map shows the Earth's continents.



Fossils of a plant species that grew 200 million years ago have been found in South America, Africa, Antarctica and Australasia.

Explain why fossils of this plant species are found on these four continents.

.....

.....

.....

..... [2]

9 Water travels through plants.

Look at the list of parts of a plant.

A leaf xylem

B stem xylem

C stoma on the surface of leaf

D root hair cell

E root xylem

Write down parts **A** to **E** in the correct order to show the pathway of water through a plant.

One has been done for you.

.....	.....	**B**	.....	.....

[2]

10 The table shows the melting points and boiling points of some Group 1 elements.

element	melting point in °C	boiling point in °C
lithium	181	1347
sodium		881
potassium	63	766
rubidium	39	688

(a) Describe the trend in the boiling point from the top to the bottom of Group 1.

..... [1]

(b) Predict the melting point of sodium.

..... °C [1]

11 Yuri investigates current in a parallel electrical circuit.

(a) Draw his circuit with:

- a battery of cells
- a closed switch
- two lamps in parallel with each other
- a meter to measure the current through one of the lamps.

Use standard electrical symbols.

[3]

(b) Yuri uses the same components to make a series electrical circuit with two lamps.

Write a sentence to compare the brightness of the two lamps in the two circuits.

.....

..... [1]

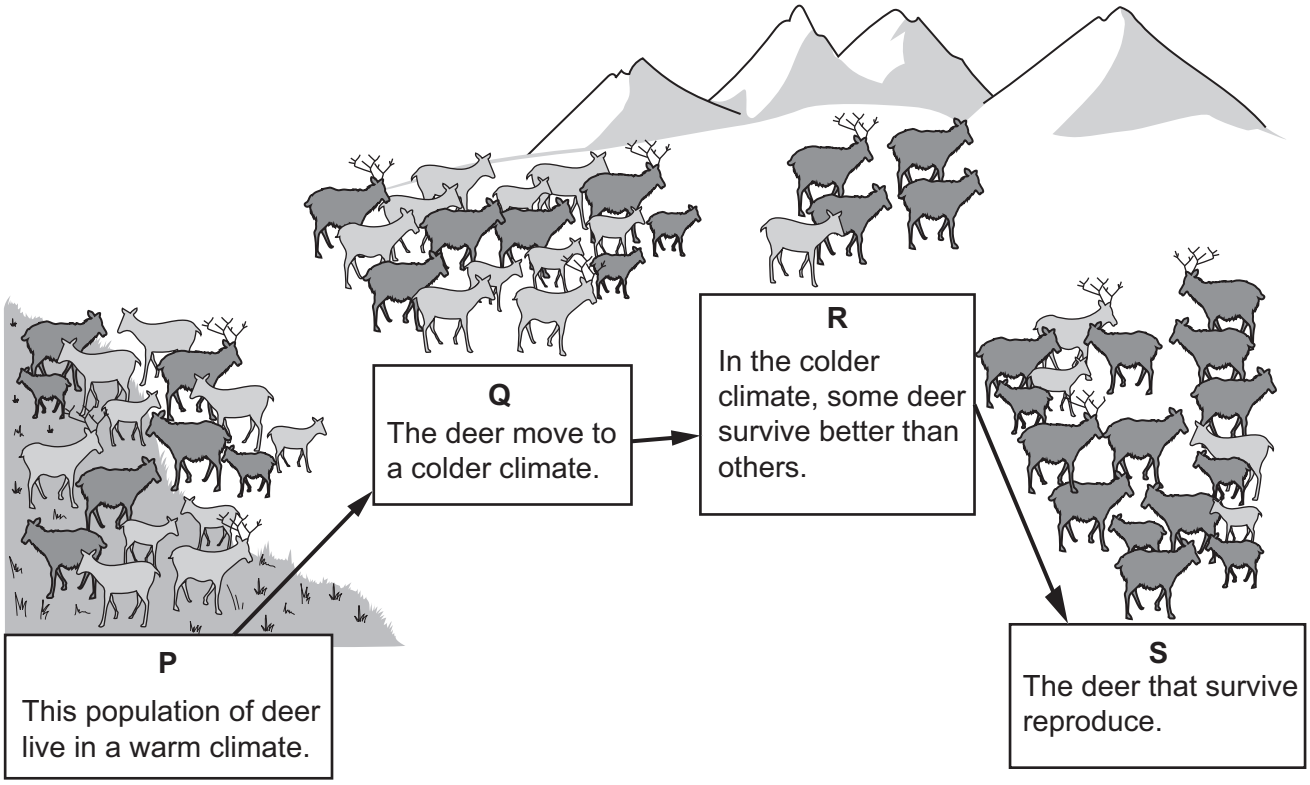
12 Complete the sentences about nebulae.

Nebulae are enormous clouds of ..... and ..... .

Some nebulae act as stellar nurseries for new ..... .

[3]

13 The diagram shows how the appearance of a deer population changes over time.



(a) Look at the diagram.

The deer show variation.

Describe **one** example of variation shown in the diagram.

..... [1]

(b) The appearance of the deer population changes over time from **P** to **S**.

The theory of natural selection explains this change in appearance.

Match each **statement about natural selection** to the correct **letter** in the diagram.

You may use each letter once, more than once or not at all.

statement about natural selection	letter
Some adaptations give advantages in one environment and **not** in another.	.....
Genes controlling features which help survival pass into offspring.	.....
Individuals with adaptations less advantageous to the environment die before they reproduce.	.....

[2]

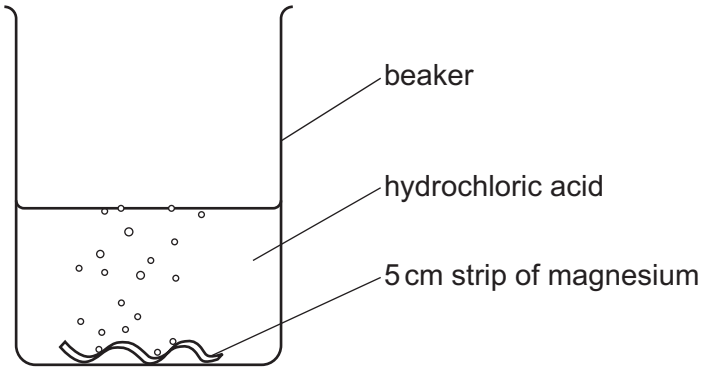
14 Oliver investigates the effect of temperature on the rate of reaction.

In his first experiment, Oliver:

- puts 20 cm^3 of dilute hydrochloric acid into a beaker
- measures the temperature of the acid
- places a 5 cm strip of magnesium into the acid
- measures the reaction time.

Oliver repeats the experiment four more times.

Each time he uses acid at a different temperature.



Look at his table of results.

temperature of acid in °C	reaction time in s
20	120
25	75
30	63
35	35
40	29

(a) Describe the relationship between the temperature of the acid and the reaction time.

.....

.....

..... [1]

(b) Oliver repeats the investigation using **more concentrated** hydrochloric acid.

Write a prediction for this investigation.

Explain your prediction using the particle model.

prediction .....

.....

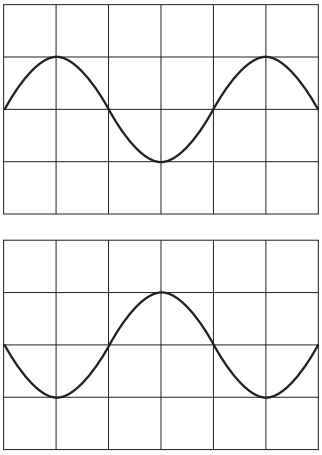
explanation .....

.....

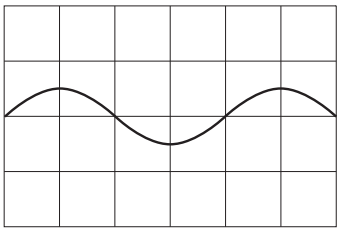
.....

[3]

15 Look at the diagram of two waveforms.



Tick (✓) the box which shows what happens when these two waveforms interact.



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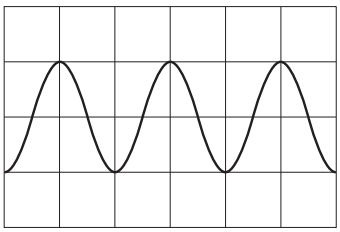

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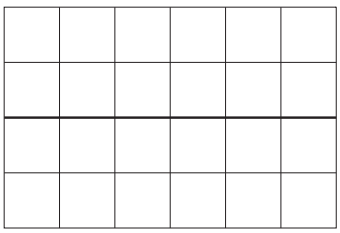

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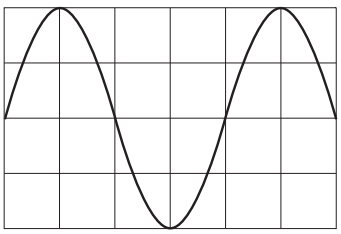


☐

[1]

16 This question is about the impact of climate change.

Write down **two** impacts of climate change.

1 .....

2 .....

[2]

17 This question is about floating and sinking.

(a) Look at the table of densities for different materials.

material	density in kg / m^3
concrete	2400
iron	7000
plastic	920
water	1000
wood	600

Which materials from the table float in water?

Explain your answer.

materials .....

explanation .....

.....

.....

[2]

(b) An object sinks in water but floats in sea water.

Predict a value for the density of sea water.

Circle the correct answer.

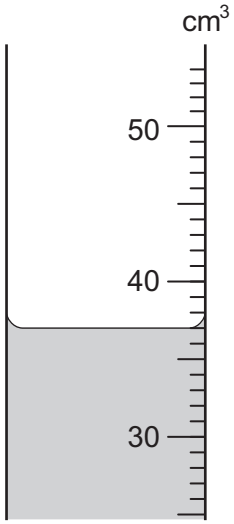
100 kg / m^3 **900 kg / m^3** **1000 kg / m^3** **1030 kg / m^3** [1]

(c) An object is put into a container full of water.

The object floats and a volume of water comes out of the container.

The water is collected in a 100 cm^3 measuring cylinder.

Look at the diagram of part of the measuring cylinder.



What volume of water is collected?

..... cm^3 [1]